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# Mineral Dissolution/Precipitation Cycles and Seismicity: A Selection of Research and the Mineral-Reaction Hypothesis of Earthquake Initiation and Its Application to Geothermal Energy

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Research on mineral reactions around seismic events presents a growing body of evidence for dissolution and precipitation playing an important role in fault phenomena. A cascade of changes are evident both from experiments, e.g. dehydroxylation in illite [1], and direct observation, e.g. of dissolution (labradorite) and precipitation (analcime) as part of earthquake processes [2]. Groundwater chemistry is likewise affected, and offers a glimpse at processes that may not be well constrained. The talk offers a summary of various related findings, and a new test for the hypothesis of mineral reactions' role in the rock failure associated with seismicity. The work also looks at telluric currents and electromagnetic induction within fault fluids as mechanisms linking seismic events to associated non-seismic phenomena [3], and also suggests applied electric fields as a means of promoting directed rock failure for deep-well geothermal reservoir development. A surface emf source may help direct hydraulic fracture at depth.

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